

# Flight Activity Officers hang STS-95 plaque



Photo by Tracy Calhoun

JSC's Flight Activities Officers earned the honor of hanging the STS-95 plaque in the Flight Control Room following the recent mission. Attending the ceremony are (left to right) Flight Activities Officers Keith Lawson, Terri Schneider, Roger Smith and STS-95 Lead Flight Director Phil Engelauf.

JSC's Flight Activities Officers earned the honor of hanging the STS-95 plaque in the Flight Control Room following the recent mission. Roger Smith, lead FAO, Terri Schneider, lead timeliner, and Keith Lawson, lead pointer, hung the plaque.

The FAOs were selected for their preflight efforts in accommodating all conflicting payload requirements and for

the unprecedented degree to which the preflight timeline survived unchanged during orbit operations. The well-designed timeline was credited with allowing the smooth execution of the mission and accomplishment of nearly 100 percent of all preflight payload objectives.

Also receiving mention were the Public Affairs Office team, which insulated the

flight control team from the distraction of media attention while still conveying to the public the full story of space shuttle mission activities on STS-95, and the Flight Management team (including Michele Brekke and Greg Buoni) for their close coordination with the Flight Control team and their efforts in resisting payload requirements growth during the mission. ■

## Teamwork made mission successful

By John Ira Petty

It's remarkable that a flight with as many scientific payloads as STS-95, experiments with sometimes conflicting demands on everything from crew time to energy to payload bay space, came together at all.

That it was as successful as it was is just a little short of amazing.

The success can be attributed to thousands, perhaps even tens of thousands, of people throughout the country, from the crew to principal investigators, from those who planned the flight, made the 80-plus experiments fit and work without negatively affecting one another to the Flight Control team – and countless others.

A lot of those people are at the Johnson Space Center.

Michele Brekke, STS-95 flight manager, said that while the crew was pivotal in making the mission work, "the whole team put forth their best effort. There were some real heroics."

It was, she said, a little like a lot of people being on a big boat. "We all had to row together if we were going to get anywhere."

The process of bringing everything together is a little like a general contractor building a house, she said. This process took more than a year. There are five key areas, each of which involved great effort and sacrifice by a lot of dedicated people:

- Negotiating requirements with payload customers and defining mission objectives came first. STS-95 experiments each had requirements and constraints. A lot consumed energy, and everyone's energy requirements had to be negotiated down. Everything had to fit. Then the Spartan solar research satellite was added to the manifest. It didn't fit into the payload bay, so one of the cross-bay carriers had to be removed and other space found for the experiments it was to have carried. The duration of the flight, originally 10 days, was reduced by a day.

- Analytical integration involved looking at those requirements and constraints of the experiments to make sure one didn't violate the constraints of another. It also included sometimes intense

negotiations to bring about reductions of requirements – particularly for power and for space.

- The flight production process generates the flight software and the software used on the ground to support crew training, the Mission Control Center and integration testing at Kennedy Space Center. It also generates paper products. "This process had to absorb these hiccups as changes were introduced into the system," Brekke said.



Michele Brekke

- Operations integration "was probably the most challenging area of this flight," she said, largely because of the number of experiments aboard. Each had some level of involvement by the crew—from as simple as throwing a single switch to as complex as the Spartan deploy and retrieve.

"We knew last summer we had a very challenging timeline, and this was before Spartan was added," Brekke said. The mission had become challenging operationally, and they were still waiting for detailed requirements of the 30 or so

experiments in the SpaceHab. "We realized in early summer that things just weren't all fitting" into the timeline, Brekke said. The call went out to streamline operations and reduce some lower-priority objectives. By the end of the summer, a workable plan had emerged.

During crew training, people with stop watches timed the crew carrying out tasks, to validate the timeline. A contingency plan of staying on the timeline, even in the face of trouble with one experiment, was developed. Any troubleshooting would be done later, at the expense of other experiments in the same group, to avoid impacting unrelated experiments.

- Physical integration and physical processing of the shuttle and the payloads also was challenging. Many of the experiments had to be installed late, on the pad, because of the nature of those experiments. One experiment had live fish and others used short-lived materials. The last was installed by about L-20 after more than 20 hours of intense effort by SpaceHab and Kennedy Space Center people.

Throughout that five-step process, "One of the important things we did on STS-95 was to make sure that all the team members' votes were heard in making decisions," Brekke said. "We tried to listen to everybody's concerns, and folks weren't afraid to bring up concerns."

A lot of the concerns were valid, and a lot of work went into resolving them.

"The timeliners in particular on this mission really earned their keep," she said, "not only in figuring out how to fit it all in, but having the courage to speak up when they didn't think it would fit."

Brekke is one of three flight managers at the Johnson Space Center, and has been in that job for almost two years. She was flight manager for STS-85 and STS-89. She also is flight manager for STS-93 (the AXAF mission), STS-92 and STS-99.

She has been at the center since mid-1977, when she started as an instructor in crew training. Subsequent assignments included stints as a payload officer, a flight director, payload integration manager and space station utilization manager. ■

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## Zarya awaits union with Unity

The activities also included activating numerous systems and conducting many checkouts including tests of the power system, command and control system, and the attitude control system. An STS-88 rendezvous day dry run, where Zarya was put through the exact sequence of events that it will go through on rendezvous day, was also conducted.

All of these tests have been successfully completed, and Zarya is in excellent condition. A few minor anomalies have been identified and are being assessed by station flight controllers in Houston and Moscow. Preparations are being made to conduct further troubleshooting and/or recovery actions during STS-88.

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— Mark Kirasich  
Lead station flight director for 2A

"Flight controllers and the engineering support teams in both Moscow and Houston are performing well in conducting the planned activities and in troubleshooting the anomalies," said Mark Kirasich, lead station flight director for the early operations. "Everyone is also very excited about STS-88."

Using the Space Station Flight Control Room in Bldg. 30, ISS flight controllers in Houston will provide continuous around the clock staffing during the docked phase of STS-88, working in coordination with shuttle flight controllers in the Space Shuttle Flight Control Room. This mission will mark the first time that space shuttle and space station flight controllers have conducted joint operations.

After the shuttle undocks, the four space station teams in Houston will rotate, providing full support for several hours each day. During this time, the teams will verify that the on-orbit elements are healthy, conduct required maintenance activities and test objectives, and review and approve the flight plan generated by their counterparts in the Mission Control Center in Moscow.

Space station flight controllers include the Russian interface officer, thermal control officer, electrical power systems officer, attitude determination and control officer, ground controller, mechanical systems officer, trajectory officer, operations planner, communications track officer, and those individuals responsible for environmental control and life support systems, and command and data handling. In addition to managing the U.S. segment, each flight controller must also know how the Russians manage their equivalent system. ■